Office of Public Outreach
Space Telescope Science Institute
Baltimore, Maryland

2002-2007 Strategic Plan for the Office of Public Outreach

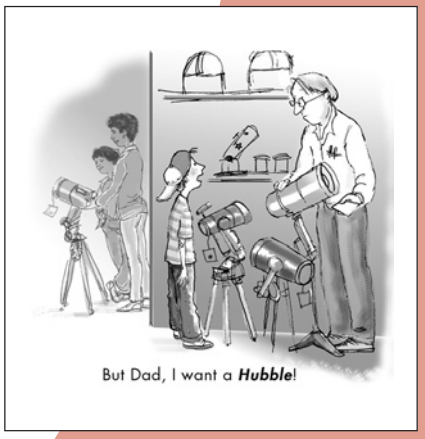
Strategies for the next five years of Education and Public Outreach

Contents:

Executive Summary

The Office of Public Outreach (OPO) of the Space Telescope Science Institute (STScI) was created to share the amazing discoveries of the Hubble Space Telescope with the American public. We are privileged to be the focal point of public attention for a storied NASA/ESA space science mission to which thousands of engineers, programmers, technicians, administrators, and scientists have devoted their professional gifts. During the last five years we have developed a multitude of products and programs that have capitalized on the intense interest in Hubble to inform and inspire millions of Americans and many others around the globe.

This document presents the new strategic plan for OPO. The plan defines a broad path for future development. Over the next five years we will expand the scope of our outreach efforts and make the best elements of our existing Education and Public Outreach (E/PO) program more innovative, effective, and efficient.



Beautiful images like this of Supernova 1987A inspired programs like Hubble Heritage, which brings an appreciation of the pure beauty of space to as wide an audience as possible.

As Hubble moves into its second decade of operation, and STScI gears up to support the Next Generation Space Telescope (NGST) and other space science missions, the range of materials and services we offer will reflect and support the changing role of the Institute.

Our Education and Public Outreach activities will continue with the five complementary strands that broadly define the communities we serve. These are:

- News
- Formal Education
- Informal Education
- Online Outreach
- Origins Forum

Pearl Jam's CD *Binaural* featured distinctive Hubble images on the cover and inside.

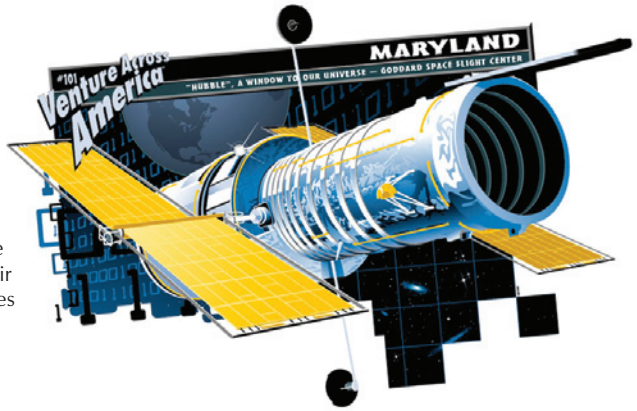
From CD covers to moving vans and more, Hubble and its images capture the imagination.

Each program will strive to reach the widest possible public audience through innovative products, services, and partnerships. Though primarily focused on Hubble, and eventually NGST, all of our efforts will emphasize leading our audience to an understanding of the bigger astronomical picture.

Each program will target a different audience but will share resources and staff to achieve maximum efficiency and ensure that good ideas, exemplary practices, and healthy innovation permeate OPO. Management will create a working environment that enables staff to realize their talents and become national leaders in their fields. We will develop products, services, and partnerships that are judged by our peers as being of the highest quality. We will proactively reach out to the astronomical community and create tools and materials that make outreach a natural extension of research.

We will partner with existing experts and centers of excellence, extending the reach of our program. We will provide a wealth of opportunities to bring the benefits of our program to society as a whole.

An exhaustive internal evaluation process and a new external advisory panel will ensure that we apply rigorous professional standards to our education and outreach materials and services, just as our science staff does to their research.



Hubble's Maryland-based command center prompted U-Haul to use the telescope to represent the state in their *Venture Across America* series of on-truck SuperGraphics.

Our Mission

We will share scientific knowledge of the universe in ways that inspire, excite, challenge, and educate.

Since its deployment in 1990, NASA's Hubble Space Telescope has given the universe a public face. From the awesome majesty of the Eagle Nebula's now-iconic pillars to the dizzying depths of the Hubble Deep Field, Hubble has become a fount of profound and beautiful celestial wonder that captivates the public's imagination.

To capitalize on the public association that has naturally developed between astronomy and Hubble, NASA has commissioned STScI to develop substantial News/Public Information and Education programs through its Office of Public Outreach (OPO).

OPO communicates and promotes scientific discoveries and technological advances made by Hubble and other space science missions in a manner that is understandable, relevant, and exciting. We aim to bring Hubble science to the forefront of the American people's attention. As the home port for NASA's Origins Education Forum we play a leading role in bringing results from all Origins missions to the public.

We will develop exemplary education and outreach activities that inspire an interest in science, mathematics, and technology and enhance the science literacy of our audience. By engaging the astronomical community we will make science research broadly accessible and relevant, and we will strongly support a research culture that encourages scientists and engineers to take an active role in science communication.

This mission is, of necessity, both supportive of and complementary to those of our stakeholders, as expressed in their own strategic plans:

NASA:

To advance and communicate scientific knowledge of Earth, the Solar System, and the universe.

NASA's Space Science Enterprise:

Share the excitement and knowledge generated by scientific discovery and improve science education.

The Office of Space Science E/PO strategic plan:

To engage its community of research scientists, managers, engineers, and support staff across the country in education and public outreach activities.

The Space Telescope Science Institute:

We will improve our education and public programs, extend them to NGST, and make them available to the rest of astronomy, assuring maximum benefit from the research enterprise to the public.

STScI serves as a home base and often hosts public outreach activites, such as talks and press conferences.

Our Vision:

How we will accomplish our mission

We will achieve excellence in every project we undertake.

OPO has established a banner reputation for producing quality science outreach products. OPO's wide range of professional talent on product development teams, from scientists to evaluators, teachers to video animators, and writers to graphic designers, has been critical to this success. We will strive continually to improve the quality of our product teams and their output and to adjust the blend of talents as necessary to tackle new challenges.

We will serve as a resource for others who wish to share the excitement of astronomy.

OPO has a rich repository of science outreach products, including Hubble images, animations, illustrations, press releases, and *Amazing Space* educational activities. We will seek partnerships with other groups to disseminate these products to the public. We will support space science missions that have E/PO goals similar to ours by openly sharing our collective expertise. We will support scientists and educators seeking opportunities for E/PO service by promoting and improving the NASA E/PO grants programs that we administer. We will provide opportunities for Hubble scientists to participate in OPO programs.

We will return to the public the fruits of their investment in space science.

OPO's mission is bound to the ultimate purpose of space science missions. Scientists use the Hubble Space Telescope to achieve particular research goals under a mandate to explore the universe. The taxpayers who support our mission seek a return on their investment in the form of science results they can understand and vistas of the universe that only space-based astronomy can deliver.

At events like NCTM, OPO distributes many of our products to the education community for free, including tips for how to use them in the classroom.

Our Goals:

How we will fulfill our vision

We will use Hubble and other missions to engage the public in the adventure of astronomical discovery.

A vacationing city dweller gazes upward, captivated by a star-studded desert sky.

A child peers through a telescope for the first time, wondering at a ringed world seemingly afloat in a celestial sea.

A museum visitor ponders two great galaxies caught by Hubble in silent mid-collision.

Just a glimpse of the universe can be a memorable and moving experience.Hubble is unrivaled as a camera for capturing celestial landscapes, and the sheer majesty of what it sees creates, in educational parlance, the ultimate "pre-engagement." Once engaged, people seek deeper meaning — the stories behind the images. The Space Telescope Science Institute is uniquely equipped to deliver these deeper stories.

Over the past eleven years Hubble has produced flagship science, receiving abundant press coverage and achieving wide public awareness, sometimes in surprising ways. The images capture much of the attention, but they are only the beginning of the story. As snapshots of hidden realities, they provoke profound questions.

The resources available to OPO include:

The images and other data that come from the Hubble Space Telescope

The world class research, engineering, and technical staff at the Institute

The HST Data Archive

The NGST home base

The staff and facilities of the Office of Public Outreach

The extensive community of Hubble observers

The network of space science educators created through the NASA Office of Space Science

We will address the fundamental questions that drive the public interest in astronomy.

Even though space science missions such as Hubble work at the frontiers of scientific research, they address questions that children can frame. Astrophysical data gathered by Hubble, and the leverage provided by Hubble's high profile, provide a tremendous opportunity for using genuine scientific data to immerse students and the public alike in some of the most fundamental questions of our time. As an important part of NASA's Origins Program, Hubble seeks to answer questions that have endured since the first campfires: Where do we come from? Are we alone?

OPO activities will stimulate people's natural curiosity about space, astronomy, and technology to bring the thrill of scientific discovery and technological accomplishment to a wide audience.

We will expand the cross section of the American public we reach.

The night sky is among humanity's ultimate "overarching" commonalities; peoples of all times, places, and cultures have enjoyed pondering and studying its wonders. Yet research shows that within contemporary American culture the public audience is diverse, possessing varying levels of attentiveness. Hence, our outreach efforts need to take into account the diverse audiences we aim to serve. Our messages must be targeted to specific groups for specific purposes. We recognize that effective communication requires a range of approaches and a variety of media, depending upon the target audience.

Each avenue will offer opportunities to develop products, services, or partnerships that employ different media in to address different audiences. For OPO to fulfill its mission, vision, and goals, we must either cultivate the necessary expertise within OPO or, where appropriate, build effective partnerships with communications professionals and dissemination experts who complement our in-house skills.

Popular publications such as *Time Magazine* feed the public's interest in science. HST has become synonymous with cutting-edge scientific discovery.

Avenues for communication include:

- Electronic and print media
  - News releases (hardcopy and video)
- The Internet
  - *HubbleSite* and Next Generation Space Telescope public websites
- Museums, planetaria, and informal education settings
  - Exhibits, planetarium shows, video material, and posters
- School systems at the state and district level
  - Formal education materials and activities, including lessons, lesson plans, tools, and workshops
- Education and outreach organizations and associations
- Organizations serving traditionally under-represented groups
- Personal contact
  - Responses to written, telephone, or e-mail inquiries
  - Supporting presentations given by members of the STScI Speakers' Bureau

We will provide resources and tools that support learning and teaching of science, technology, and mathematics.

Hubble science data, blended with input from scientists, educators, and production experts, provide a potent brew from which many effective cross-curricular products can be distilled. We will ensure that every aspect of our work with the formal education community is targeted to the needs of the audience. We will use existing dissemination networks and modern technology to make information and materials easily and widely available. In partnership with the education community, we will explore new ways of bringing the results of Hubble and other space science missions to teachers, students, and the public.

Most schools supplement traditional teaching methods with new resources available on computers, including the Internet.

We will increase the efficiency and effectiveness of each area of OPO.

We will constantly evaluate our news, education, and outreach products and programs for quality and effectiveness to assess the impact they are having. We will work to improve our internal processes to maximize the efficiency with which we deliver products and services. We will set annual goals in each area of our operation and report on progress toward these goals.

An important part of our evaluation process will be the appointment of a new external advisory panel. With members drawn from the science, news, education, and outreach communities, this panel will act as a guide, a resource, and a robust review body for our activities.

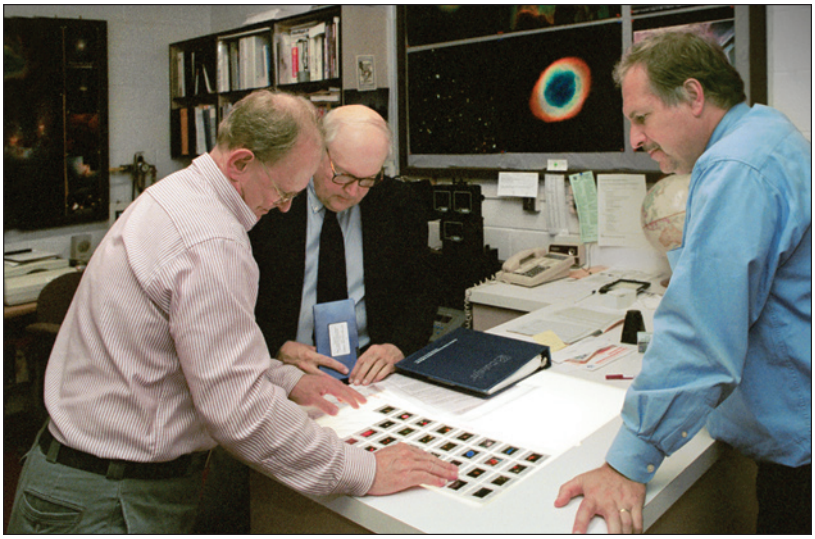
The News team crafts a press release.

Interviewing a scientist for a *HubbleMinute* feature.

We will increase the participation and effectiveness of scientists in outreach activities.

Our office will strive to increase the involvement of scientists in public outreach and their effectiveness in sharing the excitement of astronomical research with the people who fund it. Astronomers possess a deep knowledge of the universe. As pioneers of space exploration they can engage the public with experiences from the frontiers of human knowledge. We will capitalize on OPO's privileged position at STScI to broaden the participation of the entire astronomical community in outreach, to supply outreach materials that assist scientists in those activities, and to coach scientists in effective public communication skills. We will adopt a phased strategy beginning with STScI scientists, expanding to encompass the Hubble observing community and the Origins community with the final aim of reaching the astronomical community at large.

Working with scientists to bring a news story to life.



Who We Are:

A unique team for a unique opportunity

Members from every branch of OPO helped to launch *HubbleSite*. In the last year, *HubbleSite* has had over 20 million visits.

OPO is structured and staffed for the explicit purpose of executing the goals articulated in this strategic plan. Our association with the flagship of NASA's Great Observatory fleet and the high public profile that the Hubble Space Telescope enjoys attracts a large audience and provides instant "brand name recognition" for our efforts.

We are organized into branches that focus on "programs," which may be thought of as venues and techniques for reaching our diverse audiences. There are five branches: News, Online Outreach, Informal Science, Formal Education, and the Origins Education Forum.


THE SUN

Baltimore, Maryland

Congress

Universe of calculation

Several high-profile press releases from the News branch have made the front pages of newspapers like the *Baltimore Sun*, as well as prominent appearances in the *New York Times* and *Washington Post*.

News

We will keep Hubble science and technology at the forefront of public awareness of science.

The News branch is the source for Hubble press release packages, which often include text, photo, illustration, animation, video interview, and supplemental background information elements. In addition to their direct use by journalists, News products cascade into products produced by other OPO branches. The News branch is headed by a veteran science journalist.

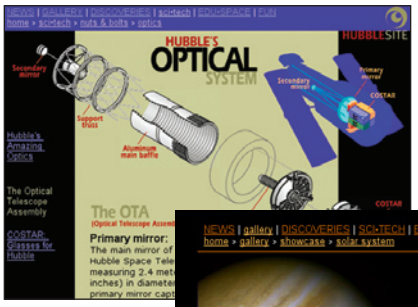
Online Outreach

We will create quality on-line materials that communicate directly to the general public.

The Online Outreach branch specializes in developing online content, such as the very popular *HubbleSite* public Website, which is visited by millions of people each year. Content ranges from optimally formatted News releases to more "timeless" background resources that explore aspects of the Hubble mission in depth. The Online Outreach branch is headed by an experienced Website developer who has a long history with NASA missions.

HubbleSite focuses on the natural beauty of HST's images to engage the viewer into learning more about the science behind them.

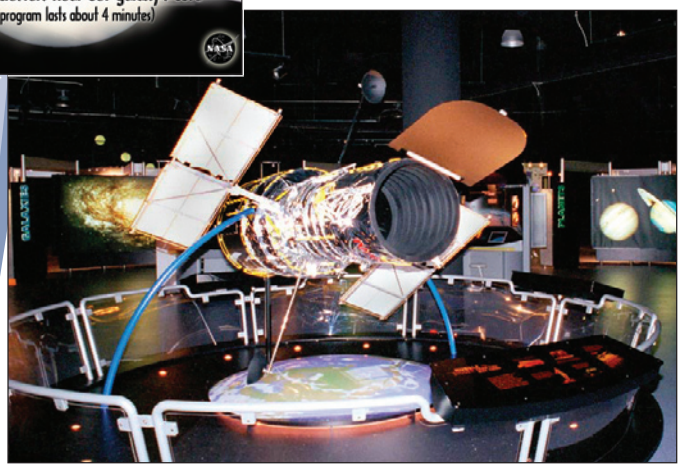
hubblesite.org



Informal Science Education

We will increase the effectiveness with which astronomy is communicated to public audiences in informal settings.

A recent survey stated that three out of every five Americans visit an informal science venue annually. Exhibits like *ViewSpace* and the *New Views of the Universe* traveling exhibition (below), developed with the Smithsonian, take Hubble's results to communities across the nation.



The Informal Science Education branch forges links with science centers, planetaria, natural history museums, and similar forums patronized by public audiences seeking to broaden their understanding of science and nature. Informal Science projects and services range from providing "raw materials" to institutionally based content developers to creating targeted products such as the popular *ViewSpace* multimedia display. The Informal Science Education branch is headed by an experienced museum/planetarium program director.

Formal Education

We will facilitate the development of formal education resources that are linked to national standards.

The Formal Education branch develops both on-line and hard-copy curriculum support products for the K-12 formal education community. These products, such as the popular *Amazing Space* series, are formulated in strict compliance with national educational standards, and are subject to a rigorous evaluation program before and after their release. The Formal Education branch is headed by an expert educational program developer and evaluator.

amazing-space.stsci.edu

The *Amazing Space* line of products includes several Websites as well as engaging printed materials like the popular trading cards, which come complete with suggested educational activities.

Origins Education Forum

We will ensure that the Origins Forum plays a key role in the NASA OSS Education Support Network, with particular attention to coordinating and helping to plan the E/PO efforts of the Origins missions.

OPO helped develop the SSERD, a central repository for educators and the public to find quality education products from all NASA OSS missions.

teachspacescience.org

In addition to the externally focused "product line" branches, OPO hosts the Origins Education Forum, a team charged with coordinating and serving the educational activities of space science missions under NASA's Origins theme. The Origins Forum coordinates product development across NASA Origins missions, provides an extensive product evaluation service, and maintains the on-line Office of Space Science *Education Resources Directory* (SSERD). The Origins Forum branch is headed by a veteran space scientist with extensive E/PO experience.

In-house skill groups

Supporting our production efforts, a corps of professionals across a wide range of disciplines provides the practical skills needed for product development and support.

Skills within OPO include:

Web, multimedia, and database programming

Image processing and output

Astronomical visualization, simulation, and animation

Video production

Curriculum development and evaluation

Graphics and illustration

Science writing

Grants administration (OPO manages two grants programs for NASA)

Project administration and management

Dedicated E/PO scientists

Beyond being inspiring and informative, OPO products must be scientifically accurate and up-to-date. For this reason, OPO product development efforts draw not just from the general science expertise found at STScI, but from a dedicated team of credentialed astronomers who are both actively involved in research and passionate about communicating the wonders of astronomy to non-scientists. OPO scientists are deployed into all product lines and function as integrated members of product development teams.

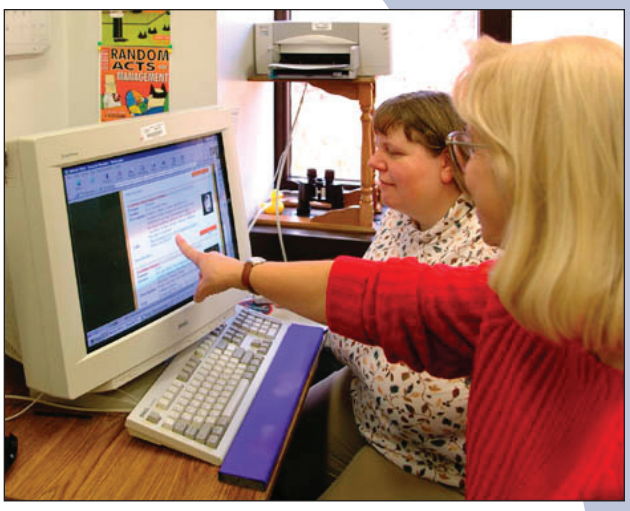
OPO scientists work closely with media specialists to create quality products for the public.

The Image Processing Lab ensures accurate color reproduction in photographic prints of HST images for OPO and the rest of STScI.

Our guiding philosophies and values

Focusing on the needs of those we serve

Our organization will be driven by the needs of the various audiences we serve. We will determine those needs via surveys, discussions, and other means as appropriate. Materials created by our programs will be evaluated against the needs and requirements of their prospective audiences. Our advisory panel will provide regular feedback and assess our performance.



Teachers often have special requirements for what they can use in the classroom; OPO teacher staff and consultants help us focus on the needs of our audiences.

Developing partnerships to reach a larger audience

OPO aims to reach the widest possible segment of the American public with its products. To ensure that we reach as diverse a community as possible, we will expand the range of target audiences for our products and will foster partnerships with professional organizations that focus on the underserved, underrepresented, and populations with special learning needs.

Sharing our knowledge and skills with the widest possible community

Breakthroughs in understanding the universe must not be shared solely with the astronomical community. Increasing the public interest in, understanding of, and support for astronomical research is important to the strategic success of the STScI. Our goal is to communicate the discoveries of our missions and to create educational materials based on these discoveries. NASA has made an investment in the STScI to build an education and outreach infrastructure. We will also seek opportunities to enable other missions to use this infrastructure to convey their scientific discoveries.

Applying innovative methods and technologies to enhance communication

OPO has a reputation as an innovator in using new technologies for astronomical outreach. For instance, the early adoption of web technology proved to be a wise investment, and much of our present work on webcasting is laying the foundation for future success in delivering high-quality content to a mass audience. In the future we will continue to seek new methods of delivering effective outreach material.

However, we will balance our desire to experiment and innovate with the recognition that the bulk of our audience may not have access to leading-edge technologies. For example, although many classrooms are equipped with computers and have high bandwidth Internet access, teachers still need and regularly use quality paper-based materials. Recognizing that one of our strengths has been the creation of products for the electronic media, OPO will seek to partner with other organizations keen on converting our educational content to more traditional media.

Higher-technology partnerships also hold great promise. For example, producers developing shows for the new generation of Digital Planetaria around the country will be seeking Hubble content. We can create tools that make it simple for them to integrate our outreach material into their productions. By making these tools available online, our products (primarily video and still imagery) will easily make their way into venues where several million Americans venture each year.

Placing Hubble (and NGST) science results within their larger astronomical contexts

When Hubble first became fully operational, one could hardly point the telescope anywhere without seeing something new and striking. In the second decade of the Hubble mission, a large repertoire of images and data is now at OPO's disposal. As this wealth of discoveries grows, so does our ability to weave many separate Hubble findings into a larger tapestry that relates each individual discovery to the over-arching questions that motivate astronomical research.

Our audiences will increasingly look to us to reflect information from as many missions and observatories as necessary to understand physical processes in the cosmos. To this end:

- Rather than limiting ourselves and our products to a Hubble-centric viewpoint, we will partner with other organizations to create a rich vein of outreach materials that address broad astronomical questions.
- We will use the high recognition of the Hubble "brand" to lead audiences to a better understanding of astronomy and space science.
- We will increase our capabilities in the realm of astronomy visualization, using advanced video technology to tell multifaceted, dynamic stories.

Phased Strategic Objectives

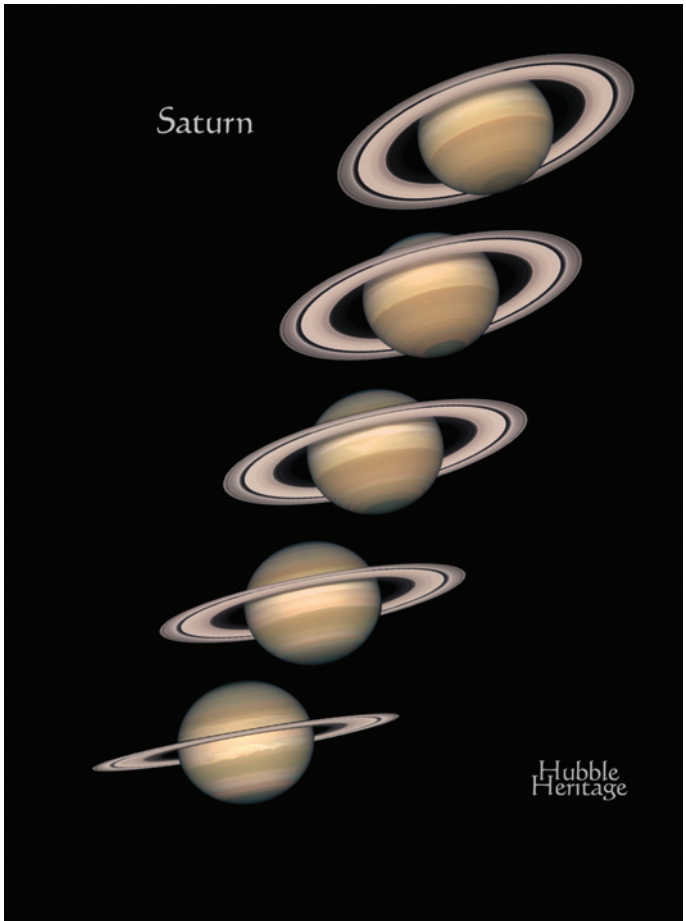
This section summarizes our strategies for the next five years. Implementation details will follow in an Implementation Plan.

Ongoing services

The following objectives describe ongoing services and processes.

- Create and disseminate high-quality education and public outreach products through a variety of media and venues to reach a large cross-section of the public.
- Offer the latest news and images from HST, putting them into the "big picture" context.
- Adopt and take advantage of new technologies as necessary to meet our audiences' needs.
- Foster collaborations on products and activities between Origins missions and strengthen meeting coordination and evaluation services.
- Promote and improve the IDEAS and HST CYCLE E/PO grants programs we administer.

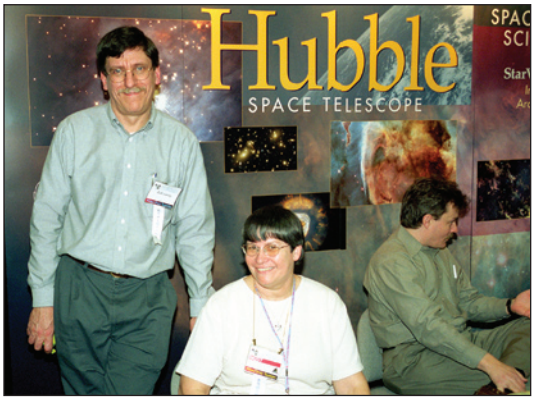
We will build upon this foundation to initiate new directions in a phased manner.



Near-term objectives (one to two years)

The following objectives will be a primary focus of OPO over the next one to two years.

- Create an independent, external panel to advise us on the scope, content, and efficacy of OPO's programs and products.
- Seek and establish collaborations and partnerships to enhance the development and increase the reach of our products.
- Serve the broadcast/print/web news media as a major "information center" resource for Hubble and related space science news (e.g., develop a Virtual Press Room).
- Create materials and content for producers of digital planetaria.
- Develop a more robust program for enabling the STScI community of scientists to participate in education and outreach and expand this program to the larger Hubble community.
- Develop a mechanism for showcasing to maximum benefit the large Advanced Camera for Surveys images.
- Enhance our ability to identify important results and assist NASA Headquarters in production of Space Science Updates on scientific results from Hubble, other Great Observatory programs, and the Origins program.
- Share recommended practices, lessons learned, and process models from all Origins missions.
- Enhance the capabilities, usability, and content of the NASA *Space Science Education Resource Directory.*
- Develop a broad dissemination strategy to maximize impact of all OPO products.

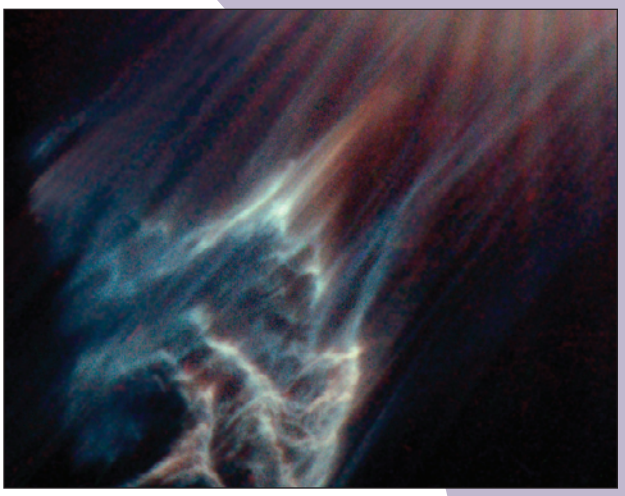


OPO staffers often provide on-site support as well as display design services for STScI outreach efforts.

Mid-term objectives (three to four years)

We anticipate completing the following objectives in the intermediate time range of three to four years.

- Develop methods to significantly increase the participation of the astronomical community in outreach; serve as a resource for scientists by supplying high-quality outreach materials and by coaching them in effective public communication.
- Offer science communication and education professionals opportunities to enhance their understanding of the context of recent Hubble and NASA discoveries.
- Support and encourage other NASA OSS missions to convey lessons learned in expanding their programs to include informal science education venues.
- Evaluate and redesign the Origins Education Forum Website to address mission needs.
- Work with the Education Support Network to expand the education program to address the needs of community colleges and astronomy programs for non-science majors; work with schools of education to develop courses that use astronomy as context for teaching science.



Barnard's Merope Nebula, IC 349, in the Pleiades star cluster.

Long-term objectives (beyond four years)

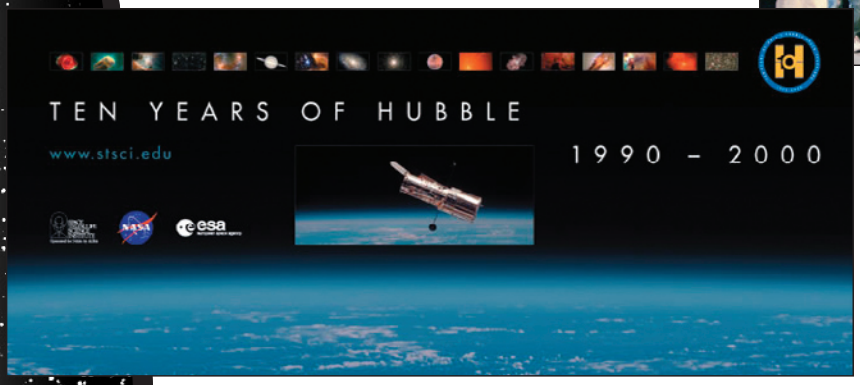
The following objectives will require a longer time frame to complete, although they may be initiated in the near- or mid-term.

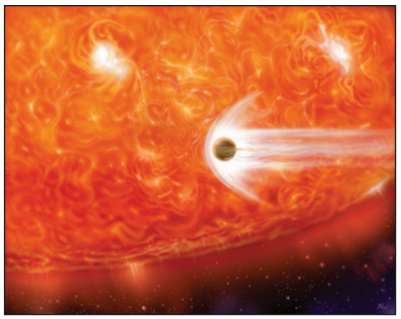
- Become a center of excellence for translating and visualizing complex astronomical phenomena.
- Make available the unique OPO infrastructure to other missions to convey their scientific discoveries.
- Develop new strategies for virtual press conferences and science communication workshops across the Web.
- Expand the online outreach program to become a primary resource for astronomical information.

NEXT GENERATION NGST SPACE TELESCOPE

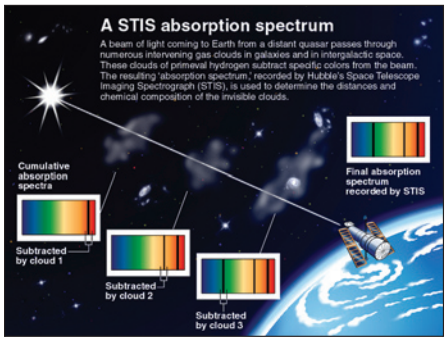
This OPO-designed logo for the NGST project reflects OPO's commitment to the future of space science research.

A 20-foot-long display and an enamel pin designed for STScI, featuring the specially designed logo in honor of HST's 10th anniversary.

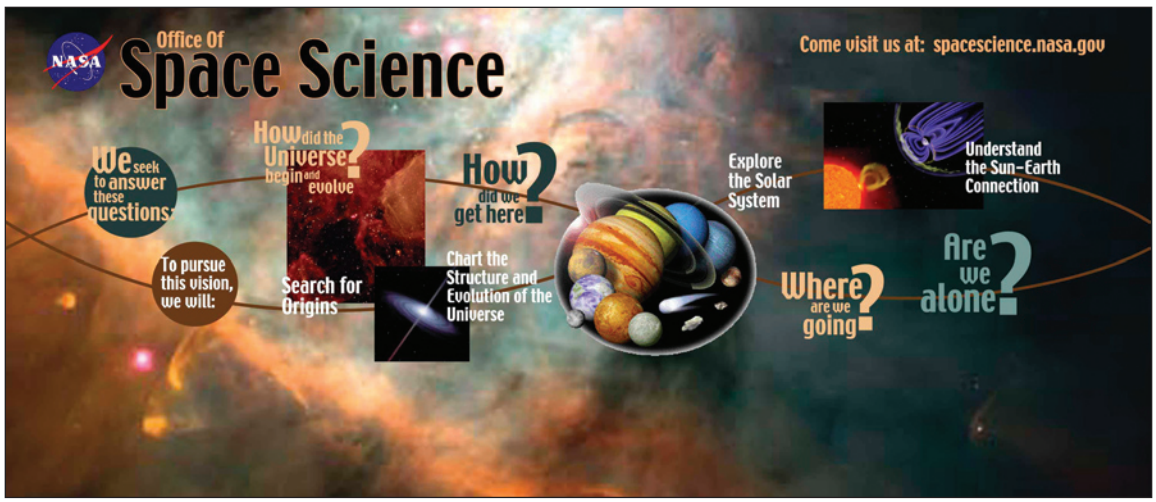




An illustration showing a Jupiter-sized planet being consumed when its star becomes a red giant.



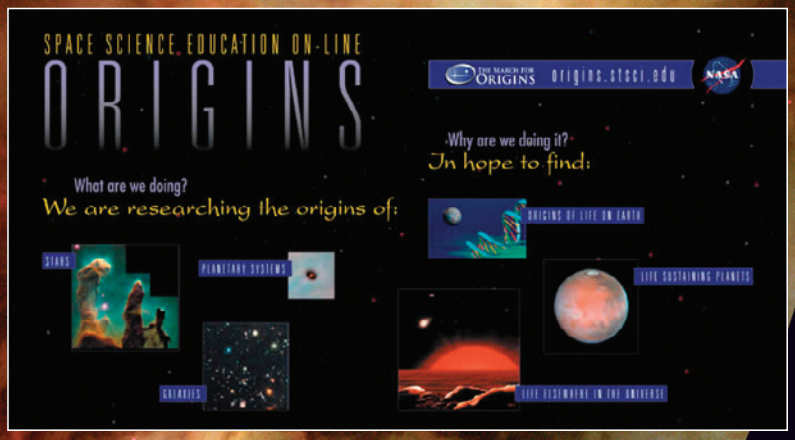
A diagram illustrating how STIS works.



This 20-foot display designed by OPO for NASA/OSS features an additional extension which can be changed as needed.

A few of OPO's education and public outreach products

An educational poster describing the process of stellar evolution.



A 10-foot-long display to promote Origins science.

Background:
NGC 3372, the Keyhole Nebula.

The cover illustration of an extra-solar planet was produced by OPO's Astronomy Visualization Lab. Illustrations and animations make it easier for non-scientists not only to understand astronomy, but to reflect on the beauty of the universe as well.

NASA

SPACE TELESCOPE SCIENCE INSTITUTE
Operated for NASA by AURA